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ABSTRACT

During the past 5 years, groundbreaking studies of adult literacy and literacy education have been conducted that can help policymakers and practitioners shape the next generation of adult literacy work in the United States. Among the topics examined in those studies were the following: relationship between literacy and economic well-being; literacy instruction and measurement; workplace literacy and competitiveness; English as a second language; family literacy; professionalization and standards; and electronic technologies in education. It was discovered that, despite increased awareness of adult literacy as a social issue and increased enrollment in literacy programs, efforts to improve adult literacy have not yet brought the dramatic gains for which policymakers, the literacy community, or the public have hoped. Useful ways to improve the effectiveness and efficiency of adult literacy programs were identified, and specific recommendations concerning adult literacy practice, research, and policy were formulated. It was concluded that making major gains toward the goal of a fully literate United States will require the following: more funding of literacy efforts; better targeting of available resources toward improving customer service; tailoring programs to address diverse needs; and developing user-friendly educational technologies. (Contains 74 endnotes and 88 references.) (MN)

NCAL

NATIONAL CENTER ON ADULT LITERACY

ADULT LITERACY

THE NEXT GENERATION

AN NCAL WHITE PAPER

National Center on Adult Literacy
University of Pennsylvania
Philadelphia, PA 19104-3111

NCAL TECHNICAL REPORT TR95-01
MAY 1995

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The National Center on Adult Literacy (NCAL) was established in 1990 by the U.S. Department of Education, with co-funding from the Departments of Labor and Health and Human Services. The mission of NCAL addresses three primary challenges: (a) to enhance the knowledge base about adult literacy; (b) to improve the quality of research and development in the field: and (c) to ensure a strong, two-way relationship between research and practice. Through applied research and development and dissemination of the results to researchers, policymakers, and practitioners, NCAL seeks to improve the quality of adult literacy programs and services on a nationwide basis. NCAL serves as a major operating unit of the Literacy Research Center at the University of Pennsylvania.

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ADULT LITERACY

THE NEXT GENERATION[1]

National Center on Adult Literacy
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Abstract

In 1993 the first report from the federally funded National Adult Literacy Survey (NALS), the most comprehensive study of its kind, was released. Nearly half of all adult Americans scored in the lowest two levels of literacy, levels that are well below what American workers need to be competitive in an increasingly global economy. Fortunately, the last five years have seen a number of ground-breaking studies that can provide guidance for policymakers and practitioners in the field of adult literacy. This report reviews the following key areas of research: literacy and economic well-being, literacy instruction and measurement, workforce literacy and competitiveness, English as a second language, family literacy, professionalization and standards, and technology. The review is accompanied by specific recommendations concerning practice, research, and policy for the next generation of adult literacy work in America.

[1] This NCAL white paper is intended to prompt discussion and debate in the field of adult literacy and adult education. It is not, and should not be considered to be, a comprehensive review of the literature, even though many footnotes are included where specific claims are made. Rather, most though not all of the findings and recommendations made in this document are strongly influenced by the combined efforts of the R&D specialists working under the mandate of the National Center on Adult Literacy. This white paper, a collective effort, was written principally by Daniel A. Wagner and Richard L. Venezky, with input from Maria Carlo, Vivian L. Gadsden, Iddo Gal, Lynda Ginsburg, Joyce Harvey-Morgan, Christopher Hopey, Susan Lytle, Larry Mikulecky, Paul Lloyd, Scott G. Paris, Stephen Reder, R. Karl Rethemeyer, and Regie Stites.

INTRODUCTION

In 1990, America's governors reached an historic consensus on a set of national educational goals as targets for the year 2000. Among these national goals was that " . . . every adult American shall be literate." While this goal was widely applauded by those in the literacy community, much more national attention (and nearly 15 times the budgetary resources[1]) has been devoted to the *other* goals that focus almost exclusively on improving the formal K-12 school system.

The relative lack of attention to adult literacy needs is even more shocking and troubling when we consider that the estimated population of adults in need of retraining, up-skilling, or developing even the most basic literacy skills is estimated to be about the same as that of the entire national school-aged population, about 40-50 million persons.[2] The striking contrast between resources allocated and population needs is one of the less well-known dimensions of America's adult literacy problem. Part of this is due to historical misperceptions.

In the 1960s, the United States was widely considered to be one of the most literate countries in the world, with a UN listed 'literacy rate' of nearly 99%, as contrasted with many developing countries with rates of 50% or lower.[3] Yet, troubling signs were beginning to emerge. In the 1970s, alarm signals began to ring as some studies claimed that the U.S. national literacy rate was far lower than national and international policymakers believed.[4] In 1993, the federally funded United States National Adult Literacy Survey (NALS), the most comprehensive study of its kind in the world, released its first report.[5] The good news was that nearly 95% of adult Americans could read at a fourth-grade level or better, showing that illiteracy in its most basic form was relatively low; but the bad news was that nearly half of all adult Americans scored in the lowest two levels of literacy, levels that the National Educational Goals Panel has stated are well below what American workers need to be competitive in an increasingly global economy.[6]

Although these findings shocked the public, research showed how it was possible, even likely, that America would continue to fail to achieve a fully literate society. For example, the NALS showed that nearly 25% of America's adults with an average of 10 years of formal schooling had only fourth-grade literacy skills (or lower).[7] In many ethnic minority groups, residing mainly in urban areas, fewer than 50% of the children complete 10 of the compulsory 12 grades of schooling.[8] Low achievement in schools, early dropout from schools, along with the increased flow of poorly educated immigrants, essentially filled the metaphorical bathtub with adults in need of further skills at least as fast as adult education programs tried to empty it through remediation and retraining. In other words, low literate[9] Americans may now be seen as a chronic feature of the American educational landscape, with all the well-known statistical relationships with increased children's school failure, lower worker productivity, crime, and welfare.[10]

Literacy by itself is an abstraction, a social aspiration that would ensure that everyone could use print to participate in modern society. But literacy, besides being a social construct, is also a set of skills and attitudes that need to be

acquired. In this report, we are concerned primarily with the skill and attitude aspects of literacy, that is, with reading, writing, basic numeracy, and document processing, along with the attitudes and beliefs that lead to the full use of these abilities in personal, social, and occupational settings. Historically, literacy has been part of the hierarchy of political power and has tended to privilege one group over another. However, while individual empowerment is not guaranteed by literacy, in America (and in most industrialized societies in today's world) it cannot occur without literacy. Furthermore, while there are numerous alternative routes to adult literacy development—through family assistance, participation in cultural, religious, and social groups, and so forth—the probability of significant literacy acquisition in adulthood through non-structured avenues is not high; and even if it were, there would still be an obligation to bring the most efficient instructional techniques to those who choose formal instruction to better their abilities.

Despite some similarities to the problems posed by K-12 schooling, the problems of efficiency and effectiveness in adult literacy work are distinct in many ways. And, these problems cannot be simplified narrowly in terms of "more class hours," "better teacher training," or "more technology," though each of these factors is relevant to improving adult learning. To understand how new policy can and should be formulated, we need to know the answers to some fundamental questions about low literacy in America.

Fortunately, we know considerably more now, in 1995, than we did a decade or even half-decade ago about how to improve literacy in America. This white paper focuses principally on the last five years, which have seen a number of important studies that can provide guidance for policymakers and practitioners in the field of adult literacy. In each of the seven main sections below (literacy and economic well-being, literacy instruction and measurement, workforce literacy and competitiveness, English as a second language, family literacy, professionalization and standards, and technology), we provide brief analyses of major research findings, followed by a series of recommendations. The white paper concludes with a synthesis of the recent past and a prognosis for what we believe will be the next generation of adult literacy work in America. We believe that this future generation has just begun.

RECENT FINDINGS ON ADULT LITERACY

LITERACY AND ECONOMIC WELL-BEING

Data from around the world provide clear evidence that literacy and education are closely related to a nation's economic development.[11] Indeed, there have been numerous international studies showing the ubiquitous impact of formal schooling on subsequent employment and income, with each year of formal education said to be "worth" between 4–10% increased lifetime income (depending on the country investigated).[12] These data have

often been utilized to support literacy programs around the world. Unfortunately, there is relatively little information available on the direct economic returns to adult literacy and adult basic education. Some research considers the rather different case of the impact of vocational or adult basic education on the occupational outcomes of workers in industrialized countries.[13] While this evidence suggests the economic utility of literacy and high school equivalency degrees in industrialized countries, there remains only modest empirical research as yet to suggest that such programs have the direct effect of enabling the unemployed to obtain new jobs or to make major career changes.[14]

The best data set that bears on the question of adult literacy and income is the NALS. Data from this survey found that the income of American adults went up by almost 50% for each level of literacy attained. Those at level one earned about $240 weekly, while those at level five earned about $650 weekly.[15] Subsequent analyses have shown that when education and other background factors are held constant, adult literacy is strongly associated with a range of important economic and social outcomes (e.g., employment, wages, poverty, informed citizenship). Not surprisingly, this research also indicates that adult literacy is deeply embedded in the economic inequities among ethnic and racial groups in this country. As recent re-analyses of the NALS data show, income differences between ethnicity and race tend to disappear when literacy and education factors are statistically controlled.[16]

Recommendations. There seems little doubt that the combined effects of education and literacy powerfully affect an individual's life chances of employment and income. The available evidence suggests that effective training can be a highly cost-effective strategy for addressing a range of our economic and social goals as well. If appropriately designed and targeted, programs can assist participants to increase their literacy proficiencies, rates of employment, wages and earnings, and active citizenship and to decrease their reliance on public assistance.[17] Thus, if America is to stay economically competitive, and if federal and state governments are intent on trying to resolve broad equity concerns through social programs that increase opportunity, adult literacy education appears to be one of the most promising investments available.

LITERACY INSTRUCTION AND MEASUREMENT

Over the past five years, sufficient data have been collected on adult literacy students to demonstrate that gains in basic skills, particularly reading, are on the average fairly small, and that remarkably little relationship exists between performance change and time spent ("seat time") in class. This latter result is due in part to the limited number of hours that the average adult spends in instruction, sometimes a period of time too short to expect measurable progress.[18] In addition, aggregated data on performance change tends to mask the considerable diversity of goals and abilities that are found in adult literacy programs. For example, some participants in ABE programs are over 60, retired, and primarily interested in the adult learning experience; others are recent high school dropouts, some with learning disabilities; still others have ESL needs (see later section), but many may wish to reach high school graduation or GED levels in reading, writing, and mathematics.

The area of adult mathematical literacy (or numeracy) should be mentioned in this context. This quantitative component of literacy instruction has traditionally received little attention from policymakers and program planners,

and only now has become the focus of research attention.[19] A recent national survey on adult mathematical literacy provision indicated that more than 80% of adult students receive math-related instruction, but less than 5% of teachers in programs are certified to teach mathematics, and very few receive preservice training in mathematics instruction.[20] Although a major reform is currently being undertaken in K-12 mathematics education, instructional strategies, teaching methods, and assessment practices in adult numeracy have lagged far behind.[21] The close ties between professional development and the improvement of instruction is an issue to which we shall return later in this paper.

Much of adult literacy instruction today is, by philosophy and design, oriented toward the stated needs and interests of program participants, particularly at the adult basic education (ABE) level. Students enter and exit as they choose, and generally select their own goals and content interests.[22] Whether this approach is effective for either the adult participants or the overall outcomes of adult literacy programs needs serious inquiry. Further, most instruction in ABE and adult secondary education (ASE) classes is spread thinly across multiple skill areas, rather than focused on particular skill needs. Given the limited amount of time adults spend in class and the limited amount of homework done, "massed practice" (devoting more concentrated time to fewer skill areas) may be more effective.[23]

A further instructional issue concerns the degree of specificity of instruction. Current programs emphasizes general basic skills instruction in reading, writing, and math, with the assumption that these skills will transfer to other contexts. Yet, research has accumulated over many years which shows that relatively little transfer occurs, and that a better balance is needed between functional context learning and basic skills practice.[24] Research suggests that the motivation for learning basic skills is enhanced when embedded in the context of work functions, as has been demonstrated especially in the military.[25]

The central issues in literacy skill measurement are related to the identification of outcomes for adult literacy instruction and the design of valid and reliable testing instruments. At present, adult literacy testing is limited by a paucity of appropriate instruments, particularly for writing and mathematical knowledge, and a near total lack of normative data for the age ranges encountered in most programs. Especially problematic is the assessment of adults at the low end of the performance scales.[26] Recent longitudinal research suggests that appropriate early diagnostic assessment may be more effective than the standardized test measures that have been used for decades for both evaluation and diagnostic purposes.[27]

Recommendations. Diagnostic and remediation models for adult literacy instruction need to be explored, with a shift of resources to incorporate more extensive diagnostic testing in literacy and basic skills programs.[28] This would mean less standardized testing of the current variety and more emphasis on individualized needs. Further, some programs should be redesigned to emphasize a restricted number of skills at one time, with intensive instruction provided. Within the subject areas taught, an appropriate balance between functional context learning and basic skills practice is needed. Also, individual change in performance needs to be measured by

both standardized basic skills tests that have been normed on adults and by applied tasks that are representative of everyday literacy challenges.[29]

Research suggests that learners should be identified according to instructionally relevant variables, such as (a) English as a second language (ESL) but literate in native language, (b) ESL but not literate in any language, (c) competent writing but poor math skills, (d) learning disabled, and so forth. By contrast most literacy programs presently classify learners according to their grade levels (as measured by standardized tests), even though the meaning of "grade level" for adults has been shown to be of dubious value.[30] Finally, program evaluation should be redesigned to give separate measures for at least three different types of learners: those found through diagnostic testing to have special needs, those for whom diagnostic tests predict normal progress, and those who are not working toward academic certification. Overall, the linkages between instruction, assessment, measurement, and professional development need to be given increased attention for the reasons enumerated above, but also because of the increased diversity in both programs and the populations served by them.

WORKFORCE LITERACY AND COMPETITIVENESS

According to the Organisation for Economic Co-operation and Development (OECD), workplace skills and worker training are now among the major priorities of all industrialized nations.[31] In fact, when seen as a labor and training issue, literacy problems are actually better thought of as a cluster of related problems calling for quite different solutions. Although business, union, and taxpayer resources for workplace literacy education have grown, service is still available to only a fraction of the individuals who need it.[32] Most service is provided through large employers and unions with taxpayers providing a lesser degree of support.[33] Workers in small businesses, unemployed, between jobs, or having special difficulties (e.g., ESL or learning disabilities) often have no access to literacy training at all. When service is offered, the most in need are the least likely to take advantage of it.[34] Significant improvement for low-level literates requires hundreds of hours. Typical workplace literacy classes, however, are brief (20-50 hours) and not linked to subsequent opportunities for continued growth. Also, evaluation of workplace literacy program effectiveness is minimal or non-existent.[35]

With limited or even diminishing resources, decisions may need to be made for maximizing returns for individuals and for the economy in general. Should, for example, persons with exceedingly low literacy abilities be placed in GED and workplace skills training programs when we have data suggesting that the likelihood of them making substantial gains is limited? On the one hand, the system should not exclude any individual on the basis of a literacy test or any other single test, nor should it guide that person to a narrow learning track that would lead, at best, to a marginal entry level job. On the other hand, expected learning gains from such individuals are often low. When more skilled and motivated workers are available, should we not ask the question of whether this group should get a higher priority for retraining for more advanced jobs? Naturally, it would be best to have sufficient funds to retrain everyone for well-paying jobs, but such funding is not likely to be available from either public or private sources, and moreover, many individuals who enter workplace training programs have learning disabilities and other barriers to literacy acquisition.

How this issue is resolved, however, involves moral and ethical decisions as well as educational ones.[36]

Motivational issues also play a role in the workplace. Longitudinal evidence now suggests that when there are strong incentives (e.g., increased compensation) for developing literacy skills, not only do workers readily participate in literacy education programs, they also increase their literacy skills, the company improves its productivity, and the workers increase their earnings.[37] Furthermore, research on clients in welfare-to-work programs who participate in literacy education activities shows that with appropriately designed programs, literacy education can result in increased proficiencies and reduced long-term dependency rates.[38] In sum, the evidence on outcomes of literacy programs indicates that when adult learners are motivated and make progress in learning, they also raise the level of their economic well-being.

The issue of incentives is also relevant at the policy level. Recent studies suggest that the availability of adult literacy and basic education programs is directly affected by the incentive structures (often built into tax rebates for the private sector) of different nations. A cross-national comparison has recently demonstrated that countries (e.g., France, Germany, and Sweden) that have progressive and payroll-based tax structures to expand job training are quite successful in getting workers to participate in programs of basic education and retraining.[39]

Recommendations. Policy recommendations for workplace and workforce literacy education are of five types: First, the amount of service needs to be increased, with reallocation of resources to foster and reward consortia of businesses, unions, educators, and private groups that develop new cooperative ways to provide service to underserved populations. Second, there needs to be increased diversity in delivery systems, so that small to medium-sized businesses have as much relative opportunity to engage in worker education as do large corporations. Third, the overall quality of training programs needs attention; this could include linking literacy program goals and outcomes to quality assurance guidelines, which are now standard in businesses competing in the global economy. Fourth, policymakers should consider the balance between individual skills and learning potential, the requirements for job skills, and rewards for learning new skills; a system that can maximize learner gains in light of employment needs is more attainable than has previously been imagined. Finally, it is becoming increasingly clear that effective designs should provide incentives for literacy development that are both direct and readily perceived by the learners, as well as by the providers (whether in the public or private sector). This could be achieved by allocating a percentage of employment benefits to be available for basic skills and other training or by working through tax incentives to employers.

ENGLISH AS A SECOND LANGUAGE

To date, there are no reliable figures on the number of adults in the United States who are in need of ESL services. Estimates based on data from the 1990 census and on the results of the NALS suggest that approximately 12-14 million adults have limited proficiency in the English language.[40] Each year federal, state, and local agencies serve only about 1.8 million ESL

adults (nearly half the total participation in adult education programs), and yet the demand for ESL services far exceeds the supply with literacy centers reporting very long waiting lists for ESL students. In fact, the demand for ESL services is so high that in many large urban centers it far exceeds the demand for standard ABE services.[41]

Furthermore, the adults who are enrolling in ESL classes across the nation are by no means a homogeneous group. Their reasons for attending ESL literacy programs are varied (e.g., to seek or maintain employment, to obtain the GED diploma, to assist children with school work, to gain entry into institutions of higher education, or to become licensed in the professions they practiced prior to immigrating to the United States). There is also much variability with respect to factors that potentially affect the manner in which adults learn and develop English literacy, such as experiences with formal schooling, previous exposure to English, and level of native language literacy.

The quality and efficiency of ESL literacy programs have been especially difficult to determine, as empirical research has only recently begun on how poorly educated adults acquire literacy in a second language.[42] One of the classic debates in this domain is the degree to which acquiring literacy in the native language facilitates adult ESL learners in acquiring literacy in English. Recent research suggests that adult learners from quite contrasting backgrounds (Spanish, Cambodian, and Korean) do benefit from their native language literacy skills (i.e., there was a transfer in basic reading skills from the first to the second literacy, irrespective of the contrasting scripts involved). Interestingly, speaking (oral comprehension) skills in English were less important for English literacy than has been previously thought. ESL adult learners could go directly to beginning English reading without becoming skilled English speakers.[43] Progress is also being made in new forms of assessment for ESL adult learners, including procedures that provide the types of diagnostic tools discussed earlier in this report.[44] It is only in the last few years that the field has begun to realize that, like low literacy itself, the multilingual and ethnic fabric of America is likely to continue well into the future.

Recommendations. The needs of ESL literacy services are large, indeed about half the current provision for adult literacy education in the United States. Based on our findings, ESL will continue to be one of the major areas of literacy work in American adult education. Furthermore, if our thesis concerning the importance of tailoring instructional programs to learner profiles and interests is correct, then much of the English-centered legislation for ESL programs that has been favored over the past decades is likely to be counterproductive. In this context, adult education and K-12 bilingual education policy cannot and should not be equated. Adults will learn only when motivated, and motivation is related to the comfort and interest levels of the learners themselves. For example, recent research on language transfer suggests that there are numerous routes to adult second language literacy proficiency. Thus, determining improved information concerning the need and type of adult ESL services should be a high priority. Research and development into the literacy learning processes of adult ESL learners, appropriate curricula, and especially the power of technology (see later section) are especially important in this domain.

FAMILY LITERACY

The number of literacy programs that involve intergenerational literacy activities for families has been steadily increasing during the past 30 years, with the beginning of Head Start in the 1960s, but especially in the last half-decade, with Even Start legislation in 1989-90. There is little consensus as yet on a single definition of family literacy, nor is there any agreed upon set of criteria for effective implementation of family literacy services. Therefore, one set of issues that is at the forefront of all family and intergenerational literacy programs concerns the definitions, philosophy, theoretical frameworks, and empirical bases of support for such programs.[45]

At present, three programs in the United States have become popular models for family literacy services: the Kenan Trust Family Literacy Project, the Missouri Parents as Teachers Program, and Parents as Partners in Reading. These three programs illustrate key features of popular family literacy services, such as (a) beginning to provide help to families during the children's infancy; (b) encouraging language development and interactive play as precursors to emergent literacy; (c) providing books, print materials, and lessons that are appropriate for the literacy levels of family members; (d) providing medical, social, and educational services that go beyond literacy learning activities; and (e) building feelings of self-efficacy in children and parents through success in literacy and collaboration with others. Many family literacy programs synthesize these principles with their own philosophical orientations and historical practices, thus creating a variety of eclectic programs.[46] However, with recent changes in funding that favor family literacy, many programs appear to feel the need to label themselves as family literacy providers, without the benefit of either a coherent family instructional program or additional training.[47]

In spite of the growing popularity of and legislative funding increases for family literacy programs, the knowledge base in this area remains rather limited. We know relatively little about the ways that low-literate parents ought to (or even are able to) teach their children to read, to learn math, and how they ought to work with instructors.[48] The available knowledge base to date stems largely from recent program evaluations, which focus more on cost and effectiveness of specific programs than on the dynamics of intergenerational learning and instruction. The only major evaluation study to date gave generally high marks to Even Start funded family literacy programs. This study showed that (a) family literacy programs may be more attractive than standard ABE programs to many low-income families (partly because they provide more services, such as child care); (b) the rate of GED completion was about twice as high as in regular adult education programs; and (c) perhaps most importantly, parents' expectations for their children's learning increased significantly.[49]

In low-income communities where many family literacy programs are targeted for African American and other families of color, family or intergenerational literacy programs may offer some special hope for overcoming long-term socio-economic problems, especially in terms of enhanced family support mechanisms. The research to date in related areas suggests that fostering change in these families will not, however, come quickly or easily, and that success will be largely dependent on the ability of the communities themselves to make such programs their own, as well as for

the programs to link with other support mechanisms designed to help low-income families.[50]

Recommendations. If the future of adult literacy depends significantly on the motivation of individuals to learn, then the growth and promise of family literacy is considerable. Family literacy programs can offer a fuller range of incentives than most other adult education programs simply because they intersect with more aspects of individuals' lives, especially in the crucial areas of child care and welfare. It would seem that we are at the beginning of what will likely be a decade of experimentation, similar to the early days of Head Start. As with Head Start, family literacy programs need to be properly field-tested and understood. Of particular importance will be the development of specialized training methodologies for family literacy instructors, who need to understand methodologies for teaching young children and adults and the interactional activities that are important for parent-child learning. Our findings suggest that there needs to be a particular emphasis on the cultural aspects of family literacy programs, since they are especially prevalent in the diverse minority communities. At the level of policy, family literacy programs need better coordination within the broader network of family support services.

PROFESSIONALIZATION AND STANDARDS

This discussion begins with a single assumption: The committed involvement of professional adult educators is required for any system-wide change, as well as for the development of standards. Professional development for adult literacy educators in the past has been narrowly focused on training related to using specific materials or tests, and has often consisted of one-shot workshops on a range of disparate topics. These activities have rarely addressed the larger pedagogical, political, social, and cultural questions that structure and inform daily practice in the field, nor have they provided a context for practitioners to address the immediate and critical questions that emerge from their own practice.

Unlike the K-12 instructional system, one major limitation for change in adult literacy is that the large majority of the instructional staff (87% in 1993) is part-time (often volunteers with high turnover), leaving relatively little time for the type of development activities that work best.[51] Furthermore, there have been only limited resources and strategies for involving full-time literacy professionals as well as volunteer and part-time instructors and tutors in meaningful learning opportunities. In the training-oriented approaches that have dominated the field, staff development has been constructed as remedial, designed in response to perceived gaps in teachers' or tutors' knowledge.[52]

Although there is considerable evidence that the training and coaching model may work reasonably well to introduce technical changes and skills, current research suggests that much of what is needed for improving teaching and learning and for linking professional development closely with program development does not lend itself to skill training.[53] Rather than expanding individual repertoires of specific, pre-determined classroom practices, recent research suggests that new approaches to professional development need to be responsive to such factors as the variability of local contexts, communities and settings for literacy education, and the importance of practitioners' roles in determining appropriate content, processes, and outcomes for staff and professional development. There is considerable evidence that the most

promising forms of professional development engage practitioners in the pursuit of genuine questions and problems over time in ways that alter their own perspectives and practice.[54]

The area of adult numeracy illustrates well the problem of professional development. Adult literacy programs have an urgent need to increase the number of teachers trained in mathematics instruction and to enhance staff development in mathematics instruction, including the use of educational technology.[55] The lack of attention to staff preparation and the extensive use of standardized tests focusing mostly on computational skills rather than the broader skills involved in numeracy (such as statistical reasoning and communication using numbers and graphs) may hinder future reform efforts.

As mentioned earlier, the issue of professional development is at the heart of any discussion of standards. Goals 2000 and other recent federal legislation have called for a variety of standards setting efforts in numerous fields, including that of adult literacy. However, at present, it is far from clear what sorts of standards are needed, and for which areas of literacy work. Based on the experience of K-12 subject areas, standards can include laborious efforts to obtain consensus on learning achievement, training, instructional methods, funding, and more. In the relatively fragmented field of adult literacy education, standards setting will pose major challenges.[56] To date, work on adult literacy content standards has been rather narrowly focused on definitions of workplace competencies, such as SCANS.[57] Fundamental disagreements among experts over what constitutes functional literacy will make moving beyond work-related literacy skills to define more general literacy competencies difficult.[58]

Because of their role in defining measures and enabling accountability, performance standards are a key link in standards-based education reform. While the NALS represents significant progress in the assessment of functional literacy skills, it was not designed to serve as a basis for establishing performance standards and is not compatible with the basic skills tests widely used in the field.[59] Discussions of adult literacy standards have thus far focused on the areas of program quality and professionalization, but in very general ways, and with little reference to our increasing understanding of how adult literacy programs work best.[60]

Recommendations. Based on the above discussion, we believe that there is a major need to enable administrators, teachers, and tutors to make professional staff training and development an ongoing process and to link staff development more closely with program improvement and evaluation. Further, staff training and development should provide teachers and administrators with increased opportunities invent local solutions for their common problems. Increasing the proportion of full-time instructors is an essential element of enhanced professional development.

Interagency relationships can strengthen the design and implementation of staff development activities that bring together a range of service providers.[61] Overall, there is a need to build capacity for leadership in staff development by supporting regional, state, and national networks that enable literacy educators from diverse settings and types of programs to form intellectual communities for generating and disseminating knowledge in the field.[62] The importance of minority professionals cannot be underestimated in

adult literacy; one of the great limitations in literacy work is that the majority of those most in need of adult basic education services are people of color, while the majority of professional staff of such programs are not.

With respect to standards setting, there is little doubt that this will be a high-stakes enterprise in adult literacy. Lacking the equivalent of a National Council of Teachers of Mathematics (which led the way in mathematics standards), the field of adult literacy will require the participation of a broad array of players, with appropriate resources and time needed for consensus-building.[63] Furthermore, our early sense is that the adult literacy content standards should not focus on developing curricular frameworks, but rather should attempt to establish a more coherent vision of desirable skills and knowledge across a diversity of contexts. In the area of adult literacy performance standards, emphasis should be placed on developing performance-based assessments that can clearly communicate expectations for student achievement, are closely linked to classroom learning and instruction, and serve as reliable and equitable measures for purposes of accountability. This will not be an easy task.

TECHNOLOGY

Electronic technologies—computers, wireless communications, videotapes, and the like—are now becoming incorporated into elementary, secondary, business, and college level education. Adult literacy programs, in contrast, lag far behind in using these newer technologies for instruction, as several major reports, including a recent OTA report and an NCAL technology survey, have indicated.[64] Demonstration projects at NCAL, including an Internet server, a collaborative training network, and a series of videoconferences have shown that important gains are possible even from a limited set of these technologies.

The findings from the NCAL technology survey showed that many adult literacy programs have a foothold (some would say a toehold) in technology, mainly in the use of microcomputers for administrative purposes.[65] Thus, while many adult literacy programs are able to address various administrative needs with technology, most do not have the funds to purchase the hardware and software required for instructional or communication purposes. The level of interest in expanding the use of technology, however, appears high among most practitioners—higher than many state and federal policymakers have recognized heretofore. It was also found that different population groups appear to have different degrees of access to computer technology. For example, ESL programs appear to have the least access to computer technology.[66] The 1993 OTA study found that although a significant amount of technology existed in business, homes, schools, colleges, and libraries that might be tapped for literacy and learning, most of it was rarely shared or used in partnership with literacy programs.

Since the OTA report, one dramatic change can be seen in the growing number of adult literacy providers who are using on-line communications. Access to on-line resources and to the Internet has become increasingly easy and relatively low cost. A number of bulletin boards and information servers have sprung up, some of which are especially designed to fill the information needs in adult literacy. These technologies hold enormous promise for the future because they can reduce the isolation that many adult literacy providers and students experience, facilitate communication among staff and students within and between programs, increase access to high quality materials and

emerging research, streamline administrative and reporting processes, and help to provide the delivery vehicle for innovative instructional and staff development approaches.[67] However, across these new technologies, there is inadequate staff training and a lack of information on effective implementation and specialized uses. NCAL has pioneered a training model (the Adult Literacy Technology Innovation Network or ALTIN), which is designed to help overcome this problem.[68]

Both the OTA study and the NCAL survey found that economic considerations were perceived to be a major impediment to technology implementation in adult literacy programs. The NCAL survey showed that funding topped the list of constraints among service providers. But economics goes even further, by inhibiting the development of the market for adult literacy software. The OTA study found that total spending for adult literacy software in 1993 was only $15 million dollars, a tiny fraction of the resources spent on all educational software development. The market remains small due to a paradox: Few practitioners purchase adult literacy software because most offerings are of low quality or are inappropriate for use with adults, while software developers are reluctant to invest in product development because the market demand is so small.[69]

Recommendations. Technology is clearly one of the most promising areas in adult literacy; indeed, we are tempted to say *the* most promising area. The opportunities for technology seem well matched with the problems in the field: dispersed and diverse population of adult learners; limited and thinly distributed expertise in learning diagnosis; a need to connect learners and instructors interactively in an asynchronous manner that takes advantage of learners' needs for independence along with their unavailability for formal classroom instruction. There is much that can be done in this area.

At the policy level, federal and state funding should be targeted specifically for technology purchase and accompanying staff development.[70] Administrative data collection through electronic media should gradually replace manual methods, with all practitioners being provided electronic access. Government can also facilitate partnerships and provide incentives to help access and leverage additional funds from the private sector, particularly in software development. With increasing interest in the interactive multimedia technologies, such software should include speech, graphics, and a high degree of user control.

Professional development is nowhere more important than in the introduction of innovative technologies into literacy work. Without ongoing staff development, and without technology training built into the staff development planning process, adult literacy programs will never utilize technology to its full potential. At the same time, additional research is needed to develop models of adult literacy learning and instruction within the context of a "wired" society, where on-line communications and on-demand, interactive instructional courseware are available in the learner's home, workplace, and literacy classroom. Development in this sector will likely be a long-term venture, as the variety of needs and rapid changes in technology will likely produce considerable ferment. For example, almost totally unexplored for literacy work so far are the creative uses of low technologies

like hand-held vocabulary devices and personal assistants, and higher technologies like intelligent computer-assisted instruction.

CONCLUSIONS

However one chooses to interpret recent survey findings such as the NALS, and whatever size one selects for the population in need of further literacy training, America faces a serious literacy problem that is already affecting our economic capacity and social well-being. As we have noted, literacy is a chronic problem that is exacerbated by poor school achievement, school dropout, and immigration from low-literate societies. Furthermore, the younger population of low-literate adults tends to be composed disproportionately of minorities and speakers of languages other than English, thus stalling a three-decade drive for social and economic equity. Although the rate of addition of higher skills jobs to the economy has been slower than predicted five and ten years ago, the trend toward such jobs and away from low-skills manufacturing jobs is unmistakable. There is no mistaking one conclusion: The pressure on America, and on individual Americans, to achieve a higher level of skills is present today and growing with each passing year.

In this white paper, we have reviewed findings from recent studies that point to useful ways to improve the effectiveness and efficiency of adult literacy programs in this country. We have noted that to be literate in America today is to possess higher levels of skills than in the past. Furthermore, the match between the contents of literacy instruction, the expertise of professional staff, and the diversity of learner backgrounds is a challenge of major proportions. We found that the variegated American literacy landscape must be better understood if we are to make progress on the national goal of producing a fully literate America. New methods for adapting instruction to individual skill profiles and motivations, for measurement and instruction in ESL, and for innovation in technology are not far away – indeed some of these innovative methods are ready today. New approaches to professional training and development have been tested successfully in the field. Family and intergenerational literacy programs have stimulated practitioners and policymakers to rethink the dynamics of how literacy education can be delivered and linked synergistically to other social programs. All of these areas, and more, are much closer to our grasp than many people know.

Yet, policymakers are increasingly faced with difficult choices about how to spend "social dollars." They need to know how tax dollars can make a real difference. Our findings show that the actual situation for adult literacy education is more problematic than is usually admitted: One recent study showed that nearly half of all new adult learners who complete one hour of instruction drop out within 16 weeks.[71] Other studies have found that perhaps the majority of adult literacy educators have had only minimal training in adult instruction, and that many programs nationwide have relatively little idea as to whether their adult students have met "desired goals" or any other standard.[72] Thus, while awareness of adult literacy as a social issue has undoubtedly increased since 1980, and enrollment in programs has increased as well, our research analysis suggests that efforts to date to improve adult literacy have not

brought the dramatic gains that have been hoped for by policymakers, the literacy community, or the public.

This is a commonly heard critique of adult literacy work in America, and could be used as evidence of why government should *not* invest more in adult literacy.[73] Such a conclusion would represent a major error in judgment. The findings outlined in this report suggest that America's literacy problems and needs are growing, not declining. Furthermore, while government investments in adult education have gone up in the last decade, they are still trivial with respect to investments in formal schooling, and with respect to the growing needs in this area.[74] The difficult situation and critical analysis of past literacy work is due more to the relative neglect of the adult education infrastructure, while massive resources have been poured into other sectors of America's national education system.

In sum, adult literacy problems in America will not go away with polite smiles and handshakes. Literacy work is very hard work, harder than work within the formal school system, for reasons that are quickly obvious. There is no professional organization of adult literacy workers, few training programs for teachers, almost no graduate training for future leaders, and relatively little funded research. Most importantly, federal and state support provides only limited coverage of the needs of America's low literates, constantly trading off quality of service in order to achieve greater coverage. The literacy community has been working hard in this area for many years, but it has made only a relatively small dent in an enduring and now growing social problem, and this at a time when skill requirements are growing as well. In present day America, our literacy efforts have not nearly met the need or the potential for success. In a real sense, the national effort to reach the goal of a fully literate America is still waiting to begin.

How can we make progress? The efforts mentioned here, and others currently underway, suggest that more funding would help, of course. But more funding is not the only answer. Resources need to be better targeted to improving the quality of education offered—in terms of effectiveness, efficiency, professionalization, and innovation. Briefly put, effectiveness means far better customer service, programs tailored to address diverse needs, and user-friendly courseware. Efficiency means improved and better funded organization of services, not programs that live hand-to-mouth on donations and intermittent government resources. Professionalization means that adult literacy workers need to be part of, and be accepted by, the professional education community, and that colleges and universities need to think more seriously about training and course offerings in adult literacy. Innovation means that the stodgy old field of adult literacy needs to open up to the same marketplace of new ideas that is buffeting the formal school system, especially concerning the use of new technologies. This short list is, of course, only the beginning of the path toward real progress. America *can* make significant progress in adult literacy, but only if new approaches to literacy work are adopted.

We believe that the prognosis for making major gains toward a fully literate America is a good one. The next decade or two ought to provide evidence of this success, assuming the resources are available, and that the focus is maintained on self-renovation. Our experience over the past five years has demonstrated that the professional staff in adult literacy—the key to

any of the innovations mentioned in this report—are ready, even eager, to rise to the challenges. But this, too, is not enough. The field as a whole, along with policymakers and legislators, must pull together in the same direction for the next generation of adult literacy work to be an improvement over the one we have just left behind.

ENDNOTES

1 Cost/pupil in K-12 education was estimated in 1991 at $3,000; for adults in adult education programs, spending (federal and state) was about $200 per adult student. See Venezky, R. L., & Wagner, D. A. (1994). *Supply and demand for literacy instruction in the United States.* NCAL Report TR94-10. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

2 The school-aged population of the United States, according to the decennial census in 1990, was 44.4 million persons, between ages 5-17 years; cf. U.S. Government Accounting Office (1993). *School age demographics.* Report GAO/HRD-93-105BR. Washington, DC: GAO. An estimated 50 million adult Americans in need of improved literacy and basic skills have been extrapolated from the NALS study, though this estimated 'need' may encompass a variety of categories that include skills beyond those that the NALS assessed. For the NALS, see Kirsch, I. S., Jungeblut, A., Jenkins, L., & Kolstad, A. (1993). *Adult literacy in America: A first look at the results of the National Adult Literacy Survey.* Washington, DC: National Center for Educational Statistics, U.S. Department of Education. One other way to consider the number of adults in need of adult basic skills is to utilize government statistics on all forms of adult education and training; these numbers show that, in 1991, nearly one out of three employed adults enrolled in at least one job-related training course in a 12-month period; cf. National Center on Educational Statistics, U.S. Department of Education. (1994). *Adult education: Employment-related training.* Report NCES 94-471. Washington, DC: Government Printing Office.

3 The data on world literacy rates have been the subject of much debate. For a recent discussion, and compilation of current statistics, see Wagner, D. A. (1992). *Literacy: Developing the future.* Unesco Yearbook of Education, 1992, Vol. 43. Paris: Unesco.

4 See, for example, NAEP. (1976). *Functional literacy: Basic reading performance.* Denver, CO Education Commission of the States and Northcutt, N. (1975). *Adult functional competence: A report to the Office of Education Dissemination Review Panel.* Austin, TX: University of Texas.

5 Kirsch et al. (1993).

6 National Educational Goals Panel. (1994). *National Educational Goals Report: Building a nation of learners.* Washington, DC: U.S. Government Printing Office. The analysis and interpretation of the NALS data are still ongoing, and some specialists view level two as adequate for maintenance in many jobs. These data also obscure the wide population differences in low literate Americans, which vary significantly by race, language, and age, just to mention a few key factors.

7 Kirsch et al. (1993).

8 National Center on Educational Statistics, U.S. Department of Education. (1993). *Dropout rates in the United States: 1992.* Report NCES 93-464. Washington, DC: Government Printing Office.

9 Since the NALS showed that only a small portion of the population (under 5%) could perform almost none of the literacy tests, many specialists prefer to say that America's problem is not 'illiteracy,' but rather 'low-literacy,' or insufficient literacy skills. In this report, then, we will generally use the term low literate or low literacy, rather than illiterate or illiteracy.

[10] For recent analyses of crime and literacy, see: Newman, A., Lewis, W., & Beverstock, C. (1993). *Prison literacy: Implications for program and assessment policy* (Technical Report No. TR93-01). Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Haigler, K. O., Harlow, C., O'Connor, P., & Campbell, A. (1994). *Literacy behind prison walls: Profiles of the prison population from the National Adult Literacy Survey*. Educational Testing Service Report to NCES. Washington, DC: Government Printing Office. On literacy and welfare, see Cohen, E., Golonka, S., Ooms, T., Owen, T., & Maynard, R. (1995). *Literacy and welfare reform: Are we making the connection?* NCAL Report TR94-16. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[11] Berryman, S. E. (1994). *The role of literacy in the wealth of individuals and nations*. NCAL Report TR94-13. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; see also Wagner (1992).

[12] See, for example, Haddad, W. D., Carnoy, M., Rinaldi, R., & Regel, O. (1990). *Education and development: Evidence for new priorities. World Bank Discussion Paper, No. 95*. Washington, DC: World Bank.

[13] Benton, L., & Noyelle, T. (1991). *Adult literacy and economic performance in industrialized nations*. New York: Eisenhower Center for the Conservation of Resources, Columbia University. Tucker, M. (1990). *America's choice: High skills or low wages!* Syracuse, NY: Center for Education and the Economy.

[14] For example, NCES has found that American young adults (especially females before the age of 20) who get a GED (high school equivalency) degree were far more likely to be employed than those that had not completed such a degree or achieved a high school diploma; see NCES. (1994). *Education and labor market outcomes of high school diploma and GED graduates*. Washington, DC: U.S. Department of Education. There remains, nonetheless, a controversy about the income and employability outcomes associated with the GED.

[15] Kirsch et al. (1993), p. xvii.

[16] Reder, S. (1995). *Literacy, equity and societal outcomes*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. Reder, S. (1994, February). NALS raises vital equity issues. *NCAL Connections*. We still know far too little about the direct and long-term consequences of adult literacy programs in America, as there are no long-term longitudinal data as yet gathered on a national sample. Further, it remains difficult to statistically disentangle literacy from years of schooling.

[17] The impact of literacy on reducing public assistance is still a matter with insufficient support, though there are some indications that properly designed programs can be quite effective in this regard. See Cohen et al. (1995).

[18] Venezky, R. L. (1995). *Literacy assessment in the service of literacy policy*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. See also Development Associates. (1994). *National Evaluation of Adult Education Programs: Final draft report*. Washington, DC: Department of Education.

[19] The NALS included a quantitative component, but recent analyses suggest that there was so much overlap between three NALS scales that little can be said specifically about numeracy from that study. For this re-analysis, see Reder, S. (1995). *What does NALS measure? Issues of dimensionality and construct validity*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[20] Gal, I., & Schuh, A. (1994). *Who counts in adult literacy programs? A national survey of numeracy education.* NCAL Report TR94-09. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[21] Gal, I. (1993). *Issues and challenges in adult numeracy.* NCAL Report TR93-15. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. On issues of professional development, see Gal, I., & Schmitt, M. J. (1994). *Proceedings. Conference on adult mathematical literacy.* NCAL Report PR94-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[22] Venezky (1995).

[23] Venezky, R. L., & Sabatini, J. (1995). *Knowledge, strategies, and fluency: A tripartite model for adult literacy learning and assessment.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[24] Mikulecky, M., Albers, P., & Peers, M. (1994). *Literacy transfer: A review of the literature.* NCAL Report TR94-05. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[25] Attention needs to be given in instruction to three separate domains for any subject: the knowledge base required by the subject, the strategies required for understanding (or producing) the texts typically found in the domain, and fluency in the basic skills that are required for more complex tasks; see Venezky & Sabatini (1995). For a recent review of the military experience, on functional context learning, see Sticht, T. (1995). *The military experience and workplace literacy: A review and synthesis for policy and practice.* NCAL Report TR94-01. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[26] Venezky, R. L., Bristow, P., & Sabatini, J. (1993). *When less is more: A comparative analysis for placing students in adult literacy classes.* NCAL Report TR93-08. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. This study also showed that more accurate placement could be accomplished with the use of shorter rather than longer placement procedures.

[27] Venezky et al. (1993); Venezky, R. L. (1995). *Patterns of adult reading development: A longitudinal study.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[28] A hierarchical testing model, whereby the amount of testing done is a function of the complexity of skill, knowledge, and affective problems in the individual, may lead to affordable and effective diagnostic systems. With digital communications, expertise in test evaluation could be provided from a small number of sites within states or even regions, similar to certain medical practices where cardiographic data are transmitted to remote sites for analysis. Shafrir, U. (1995). *Adult literacy and study skills: Issues in assessment and remediation.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. See Venezky et al. (1993), and earlier footnote, about the use of shorter standardized testing procedures.

[29] An alternative that should be explored is to emphasize basic skills for low performing adults, and functional abilities for higher performers.

[30] Venezky, R. L., Bristow, P., & Sabatini, J. (1993). *When less is more: A comparative analysis for placing students in adult literacy classes.* NCAL Report TR93-08. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[31] Hirsch, D., & Wagner, D. A. (Eds.). (1994). *What makes workers learn? The role of incentives in workplace education and training.* Cresskill, NJ: Hampton Press.

[32] Tucker, M. (1990). Chisman, F. P. (1989). *Jump Start: The federal role in adult literacy.* Southport, CN: Southport Institute for Policy Analysis; Faisen, T. E., Vencill, M. P., McVey, J. W., Hollenbeck, K. M., & Anderson, W. C. (1992). *Ahead of the curve: Basic skills programs in four exceptional firms.* Southport, CN: Southport Institute for Policy Analysis.

[33] Mikulecky, L. (1995). Workplace literacy programs: Organizations and incentives. In D. Hirsch & D. Wagner (Eds.), *What makes workers learn.* Cresskill, NJ: Hampton Press.

[34] Kaestle, C., Mikulecky, L., Finn, J., Johnson, S., & Campbell, A. (1995). *Adult literacy and education in America: Results from the National Adult Literacy Survey.* Washington, DC: National Center for Educational Statistics.

[35] Kutner, M., Sherman, R., Webb, L., & Fisher, C. (1991). *A review of the national workplace literacy program.* Washington, DC: U.S. Department of Education, Office of Planning, Budget and Evaluation. Also, Mikulecky, L., & D'Adamo-Weinstein, L. (1991). Evaluating workplace literacy programs. In M. Taylor, G. Lewe, & J. Draper (Eds.), *Basic skills in the workplace* (pp. 481-499). Toronto, Canada: Culture Concepts Inc. A recent review of the basic skills evaluation studies in the military is provided in Sticht (1995).

[36] In the public school system, such a discussion of 'triage' would be considered to be antithetical, because all children are thought to have considerable potential (however defined). In the workplace, by contrast, workers are often selected for further (or limited) training by virtue of past performance, motivation, and potential. A triage system in adult workplace training, therefore, seems less unthinkable, and might produce significantly greater overall learning gains, even while holding the resources constant. Further thoughts on implementing such a system are beyond the scope of this paper. One final point: there already exists a self-selection process in adult education participation; a recent study shows that participation in adult education is significantly more likely among those adults who have already had some postsecondary education. See NCES. (1993). *Adult education: Main reasons for participating.* NCES93-451. Washington, DC: National Center for Educational Statistics.

[37] Reder, S. (1994). *Learning to earn: The role of incentives in work-based learning.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[38] Reder, S., & Wikelund, K. R. (1994). *Steps to success: Literacy development in a welfare-to-work program.* Washington, DC: National Institute for Literacy.

[39] Hirsch & Wagner (1994). See also, Stern, D., & Wagner, D. A. (Eds.). (in press). *The school-to-work transition: A cross-national analysis.* Cresskill, NJ: Hampton Press; and United States Congress, Office of Technology Assessment. (1990). *Worker training: Competing in the new international economy.* (OTA-ITE-457). Washington, DC: U.S. Government Printing Office.

[40] Recent data show that the percentage of persons 5 years and older who speak a language other than English has grown about 40% in the last decade, from 9% in 1979 to 12% in 1989. National Center on Educational Statistics. (1993). *Language characteristics and schooling in the United States, a changing picture: 1979-1989.* Report 93-699. Washington, DC: U.S. Government Printing Office.

[41] Chisman, F. P., Wrigley, H. S., & Ewen, D. T. (1993). *ESL and the American dream.* Washington, DC: Southport Institute for Policy Analysis. Indeed, in the state of California, nearly 80% of all ABE instruction is for individuals whose native language is not English.

[42] Carlo, M. S., & Skilton Sylvester, E. E. (1994a). *Adult second language reading research: How may it inform assessment and instruction.* Draft NCAL Report. Philadelphia:

University of Pennsylvania, National Center on Adult Literacy; Gillespie, M. K. (1994). *The rationale for adult native language literacy and directions for research.* NCAL/CAL Report TR94-03. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. It should be noted that there is substantially more evidence on how 'well-educated' adults learn to read in a second language; this is the field of foreign language acquisition, but these findings are on populations (college students for the most part) that are dissimilar to those individuals in ESL adult literacy programs. Carlo, M. S., & Skilton Sylvester, E. E. (1994b). *Validation of an English language assessment used with English as a second language adult literacy learners.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[43] Carlo, M. S., & Skilton Sylvester, E. E. (1994c). *A longitudinal investigation on the literacy development of Spanish-, Korean-, and Cambodian-speaking adults learning to read English as a second language.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. An analogous study, undertaken in North Africa, found similar first and second literacy results among Moroccans learning Arabic and French, languages which contrast greatly in syntax and orthography; see Wagner, D. A. (1993). *Literacy, culture and development: Becoming literate in Morocco.* New York: Cambridge University Press.

[44] Carlo & Skilton Sylvester (1994b).

[45] See Gadsden, V. L. (1994). *Understanding family literacy: Conceptual issues facing the field.* NCAL Report TR94-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Auerbach, E. R. (1989). Toward a social-contextual approach to family literacy. *Harvard Educational Review, 59,* 165-187; Daisey, P. (1991). Intergenerational literacy programs: Rationale, description, and effectiveness. *Journal of Clinical Child Psychology, 20,* 11-17.

[46] Gadsden, V. L., Scheffer, L. C. P., & Hardman, J. (1994). *Children, parents, and families: An annotated bibliography on literacy development in and out of program settings.* NCAL Report TR94-04. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Edwards, P. A. (1991). Fostering early literacy through parent coaching. In E. H. Hiebert (Ed.), *Literacy for a diverse society: Perspectives, practices and policies* (pp. 199-212). New York: Teachers College Press, Columbia University; National Center for Family Literacy. (1994). *Newsletter,* March, Vol. 8, Issue 2. Louisville, KY: National Center for Family Literacy.

[47] Paris, S. G., Gadsden, V. L., & Parecki, A. D. (1995). *Family literacy: Characteristics of exemplary programs in Michigan, 1994.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[48] Most of the research on parents' teaching their own young children has been done in naturalistic settings, rather than in the structured environment of family literacy programs. See, e.g, Heath, S. B. (1982). What no bedtime story means: Narrative skills at home and at school. *Language in Society, 11,* 49-76. See also, Thornburg, D. G. (1993). Intergenerational literacy learning with bilingual families: a context for the analysis of social mediation of thought. *Journal of Reading Behavior, 25,* 323-349.

[49] U.S. Department of Education. (1994). *National evaluation of the Even Start Family Literacy Program: Report on effectiveness, analysis of highlights.* Washington, DC: U.S. Government Printing Office. Data from this study showed mixed results on actual adult literacy learning between program and control groups, even though amount of learning was related to number of hours of instruction. Costs were found to vary "tremendously" across projects, ranging from about $1600 per family to $6300 per family over one program year.

[50] See Anderson, J. D. (1994). Literacy and education in the African-American experience. In V. L. Gadsden & D. A. Wagner (Eds.), *Literacy among African-American youth*. Cresskill, NJ: Hampton Press; also Edwards, P. A. (1994). Connecting African-American parents and youth to the schools reading curriculum: Its meaning for school and community literacy. In V. L. Gadsden & D. A. Wagner (Eds.). *Literacy among African-American youth*. Cresskill, NJ: Hampton Press; Johnson, C., Sum, A., & Weill, J. (1988). *Vanishing dreams: The growing economic plight of America's young families*. Publication of the United States Children's Defense Fund, Washington DC: United States Government Printing Office. See Cohen et al. (1994), for a review of linkages between family literacy and other family initiatives tied to the welfare system.

[51] For breakdowns across years, see: National Adult Education Professional Development Consortium. (1994). *Report on the adult education program, Program years 1990-1993*. Washington, DC: Author. Note also that even though few in numbers, full-time staff actually teach nearly half of all program hours.

[52] Lytle, S. L., Belzer, A., & Reumann, R. (1992a). *Invitations to inquiry: Rethinking staff development in adult education*. NCAL Report TR92-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Cochran-Smith, M., & Lytle, S. L. (1993). *Inside/Outside: Teacher research and knowledge*. New York: Teachers College Press.

[53] Little, J. W. (1993). Teachers' professional development in a climate of reform. *Educational Evaluation and Policy Analysis. 15*(2), 129-151; Lieberman, A., & Miller, L. (Eds.) (1991). *Staff development for the education in the '90's: New demands, new realities, new perspectives*. New York: Teachers College Press; Fingeret, H. A. (1993). *Adult literacy education: Current and future directions: An update*. Columbus, Ohio: ERIC Clearinghouse.

[54] Lytle, S. L., Belzer, A., & Reumann, R. (1992). *Developing the professional workforce for adult literacy education*. NCAL Report PB92-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Lytle, S. L., Belzer, A., & Cantafio, E. J. (1995). *Inquiry-based professional/staff development: A conceptual model for adult literacy educators*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Lytle, S. L., Belzer, A., & Cantafio, E. J. (1995). *Reconstructing professional development: Knowledge, practice, and agency*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[55] This national survey was conducted by NCAL on a sample of 350 adult education programs from 15 states. See Gal, I., & Schuh, A. (1994). *Who counts in adult literacy programs? A national survey of numeracy education*. Technical report TR94-09. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[56] For a review and prognosis on these issues, see Stites, R., Foley, E., & Wagner, D. A. (1995). *Standards for adult literacy: Problems and prospects*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[57] Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: U.S. Government Printing Office; Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). (1992). *Learning a living: A blueprint for high performance*. Washington, DC: U.S. Government Printing Office.

[58] For an overview of this issue, see Venezky, R. L. (1992). *Matching literacy testing with social policy: What are the alternatives*? NCAL Report PB92-01. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[59] Venezky, R. L., Bristow, P. S., & Sabatini, J. P. (1993). *When less is more: A comparative analysis for placing students in adult literacy classes.* NCAL Report TR93-08. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[60] For a recent useful summary, designed for practitioners, on how to improve adult literacy programs, see Lord, J. (1994). *Adult literacy programs: Guidelines for effectiveness.* Washington, DC: OERI, U.S. Department of Education.

[61] This would be analogous to the charter school concept, which provides opportunities for smaller clusters of individuals and actors to work on common problems together, with fewer administrative layers.

[62] See later discussion of ALTIN, in the section on technology, as an example of a staff development network.

[63] National Council of Teachers of Mathematics (NCTM). (1989). *Curriculum and evaluation standards for school mathematics.* Reston, VA: Author. See also, the discussion of 'opportunity-to-learn' standards in: National Governors Association. (1993). *The debate on opportunity-to-learn standards.* Washington: DC: Author.

[64] United States Congress, Office of Technology Assessment. (1993). *Adult literacy and new technologies: Tools for a lifetime* (OTA-SET-550). Washington, DC: U.S. Government Printing Office; Harvey-Morgan, J., Hopey, C., & Rethemeyer, R. K. (1995). *Computers, technology, and adult literacy: Results of a national survey on computer technology use in adult literacy programs.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy .

[65] Harvey-Morgan et al. (1995). Of course, there was also use for instruction, networking, and so forth, but these uses were present only in a modest fraction of the national sample. Notably lacking was significant student usage of microcomputers.

[66] This result may be caused by the low quality of software for ESL adult students, and the perception that ESL students cannot (or should not) use the technology because it demands a level of literacy skills beyond their capabilities.

[67] For background, see Turner, T. C. (1993). *Literacy and machines: An overview of the use of technology in adult literacy programs.* NCAL Report TR93-3. Philadelphia: University of Pennsylvania, National Center on Adult Literacy; Rethemeyer, R. K. (1995). *Joining the on-line community: An introduction for adult literacy.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[68] Harvey-Morgan, J. (1995). *The Adult Literacy Technology Innovation Network (ALTIN): Technology planning and implementation model.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy. The ALTIN project was supported in part by the Lila Wallace - Reader's Digest Fund.

[69] For an in-depth discussion of these issues, see Harvey-Morgan, J. (1995). *Report on the Adult Literacy Software Development Conference.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

[70] Ironically, adult education departments in numerous states are, as of 1995, still *prohibited* from allowing their funds to be used for technology equipment purchases.

[71] Development Associates. (1994). *National Evaluation of Adult Education Programs: Final draft report.* Washington, DC: Department of Education. Also, Development Associates. (1993). *Profiles of new client characteristics: Second interim report.* Washington, DC: Department of Education.

[72] According to a recent survey, part-time tutors outnumber full-time teachers by about four to one; see Development Associates. (1993). *National Evaluation of Adult Education Programs: First interim report.* Washington, DC: Department of Education. Meeting desired goals has been one common way of measuring "success" of a student's time in adult literacy programs; this measure has been and is still debated in the field. Beder, H. (1991). *Adult literacy: Issues for policy and practice*. Malabar, FL: Krieger; Lytle, Belzer, & Reumann (1992a); Development Associates (1994).

[73] It is also a critique heard of adult literacy and adult education in other countries as well. See Wagner (1992).

[74] Federal and state investments in adult education over the past decade have gone from about $175 million to about $780 million in 1991. See Venezky & Wagner (1994).

REFERENCES

Anderson, J. D. (1994). Literacy and education in the African-American experience. In V. L. Gadsden & D. A. Wagner (Eds.), *Literacy among African-American youth*. Cresskill, NJ: Hampton Press.

Auerbach, E. R. (1989). Toward a social-contextual approach to family literacy. *Harvard Educational Review, 59*, 165-187.

Beder, H. (1991). *Adult literacy: Issues for policy and practice*. Malabar, FL: Krieger.

Benton, L., & Noyelle, T. (1991). *Adult literacy and economic performance in industrialized nations*. New York: Eisenhower Center for the Conservation of Resources, Columbia University.

Berryman, S. E. (1994). *The role of literacy in the wealth of individuals and nations*. NCAL Report TR94-13. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Carlo, M. S., & Skilton Sylvester, E. E. (1994a). *Adult second language reading research: How may it inform assessment and instruction*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Carlo, M. S., & Skilton Sylvester, E. E. (1994b). *Validation of an English language assessment used with English as a second language adult literacy learners*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Carlo, M. S., & Skilton Sylvester, E. E. (1994c). *A longitudinal investigation on the literacy development of Spanish-, Korean-, and Cambodian-speaking adults learning to read English as a second language*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Chisman, F. P. (1989). *Jump Start: The federal role in adult literacy*. Southport, CN: Southport Institute for Policy Analysis.

Chisman, F. P., Wrigley, H. S., & Ewen, D. T. (1993). *ESL and the American dream*. Washington, DC: Southport Institute for Policy Analysis.

Cochran-Smith, M., & Lytle, S. L. (1993). *Inside/Outside: Teacher research and knowledge*. New York: Teachers College Press.

Cohen, E., Golonka, S., Ooms, T., Owen, T., & Maynard, R. (1995). *Literacy and welfare reform: Are we making the connection?* NCAL Report TR94-16. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Daisey, P. (1991). Intergenerational literacy programs: Rationale, description, and effectiveness. *Journal of Clinical Child Psychology, 20*, 11-17.

Development Associates. (1993). *National Evaluation of Adult Education Programs: First interim report*. Washington, DC: Department of Education.

Development Associates (1993). *Profiles of new client characteristics: Second interim report*. Washington, DC: Department of Education.

Development Associates (1994). *National Evaluation of Adult Education Programs: Final draft report*. Washington, DC: Department of Education.

Edwards, P. A. (1991). Fostering early literacy through parent coaching. In E. H. Hiebert (Ed.), *Literacy for a diverse society: Perspectives, practices and policies* (pp. 199-212). New York: Teachers College Press, Columbia University.

Edwards, P. A. (1994). Connecting African-American parents and youth to the schools reading curriculum: Its meaning for school and community literacy. In V. L. Gadsden & D. A. Wagner (Eds.), *Literacy among African-American youth.* Cresskill, NJ: Hampton Press.

Faisen, T. E., Vencill, M. P., McVey, J. W., Hollenbeck, K. M., & Anderson, W. C. (1992). *Ahead of the curve: Basic skills programs in four exceptional firms.* Southport, CN: Southport Institute for Policy Analysis.

Fingeret, H. A. (1993). *Adult literacy education: Current and future directions: An update.* Columbus, Ohio: ERIC Clearinghouse.

Gadsden, V. L. (1994). *Understanding family literacy: Conceptual issues facing the field.* NCAL Report TR94-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Gadsden, V. L., Scheffer, L. C. P., & Hardman, J. (1994). *Children, parents, and families: An annotated bibliography on literacy development in and out of program settings.* NCAL Report TR94-04. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Gal, I. (1993). *Issues and challenges in adult numeracy.* NCAL Report TR93-15. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Gal, I., & Schmitt, M. J. (1994). *Proceedings. Conference on adult mathematical literacy.* NCAL Report PR94-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Gal, I., & Schuh, A. (1994). *Who counts in adult literacy programs? A national survey of numeracy education.* NCAL Report TR94-09. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Gillespie, M. K. (1994). *The rationale for adult native language literacy and directions for research.* NCAL/CAL Report TR94-03. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Haddad, W. D., Carnoy, M., Rinaldi, R., & Regel, O. (1990). *Education and development: Evidence for new priorities. World Bank Discussion Paper, No. 95.* Washington, DC: World Bank.

Haigler, K. O., Harlow, C., O'Connor, P., & Campbell, A. (1994). *Literacy behind prison walls: Profiles of the prison population from the National Adult Literacy Survey.* Educational Testing Service Report to NCES. Washington, DC: Government Printing Office.

Harvey-Morgan, J. (1995). *The Adult Literacy Technology Innovation Network (ALTIN): Technology planning and implementation model.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Harvey-Morgan, J. (1995). *Report on the Adult Literacy Software Development Conference.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Harvey-Morgan, J., Hopey, C., & Rethemeyer, R. K. (1995). *Computers, technology, and adult literacy: Results of a national survey on computer technology use in adult literacy programs.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy .

Heath, S. B. (1982). What no bedtime story means: Narrative skills at home and at school. *Language in Society, 11,* 49-76.

Hirsch, D., & Wagner, D. A. (Eds.). (1994). *What makes workers learn? The role of incentives in workplace education and training.* Cresskill, NJ: Hampton Press.

Johnson, C., Sum, A., & Weill, J. (1988). *Vanishing dreams: The growing economic plight of America's young families.* Publication of the United States Children's Defense Fund, Washington DC: U.S. Government Printing Office.

Kaestle, C., Mikulecky, L., Finn, J., Johnson, S., & Campbell, A. (1995). *Adult literacy and education in America: Results from the National Adult Literacy Survey.* Washington, DC: National Center for Educational Statistics.

Kirsch, I. S., Jungeblut, A., Jenkins, L., & Kolstad, A. (1993). *Adult literacy in America: A first look at the results of the National Adult Literacy Survey.* Washington, DC: National Center for Educational Statistics, U.S. Department of Education.

Kutner, M., Sherman, R., Webb, L., & Fisher, C. (1991). *A review of the national workplace literacy program.* Washington, DC: U.S. Department of Education, Office of Planning, Budget and Evaluation.

Lieberman, A., & Miller, L. (Eds.) (1991). *Staff development for the education in the '90's: New demands, new realities, new perspectives.* New York: Teachers College Press.

Little, J. W. (1993). Teachers' professional development in a climate of reform. *Educational Evaluation and Policy Analysis. 15*(2), 129-151.

Lord, J. (1994). *Adult literacy programs: Guidelines for effectiveness.* Washington, DC: OERI, U.S. Department of Education.

Lytle, S. L., Belzer, A., & Cantafio, E. J. (1995). *Inquiry-based professional/staff development: A conceptual model for adult literacy educators.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Lytle, S. L., Belzer, A., & Cantafio, E. J. (1995). *Reconstructing professional development: Knowledge, practice, and agency.* Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Lytle, S. L., Belzer, A., & Reumann, R. (1992). *Developing the professional workforce for adult literacy education.* NCAL Report PB92-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Lytle, S. L., Belzer, A., & Reumann, R. (1992a). *Invitations to inquiry: Rethinking staff development in adult education.* NCAL Report TR92-02. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Mikulecky, L. (1995). Workplace literacy programs: Organizations and incentives. In D. Hirsch & D. Wagner (Eds.), *What makes workers learn.* Cresskill, NJ: Hampton Press.

Mikulecky, L., & D'Adamo-Weinstein, L. (1991). Evaluating workplace literacy programs. In M. Taylor, G. Lewe, & J. Draper (Eds.), *Basic skills in the workplace* (pp. 481-499). Toronto, Canada: Culture Concepts Inc.

Mikulecky, M., Albers, P., & Peers, M. (1994). *Literacy transfer: A review of the literature.* NCAL Report TR94-05. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

NAEP. (1976). *Functional literacy: Basic reading performance.* Denver, CO: Education Commission of the States.

National Adult Education Professional Development Consortium. (1994). *Report on the adult education program, Program years 1990-1993.* Washington, DC: Author.

National Center for Family Literacy. (1994). Newsletter, March, Vol. 8, Issue 2. Louisville, KY: National Center for Family Literacy.

National Center on Educational Statistics (NCES). (1994). *Adult education: Employment-related training.* Report NCES 94-471. Washington, DC: Government Printing Office.

National Center on Educational Statistics (NCES). (1993). *Adult education: Main reasons for participating.* NCES93-451. Washington, DC: National Center for Educational Statistics.

National Center on Educational Statistics (NCES). (1993). *Dropout rates in the United States: 1992*. Report NCES 93-464. Washington, DC: Government Printing Office.

National Center on Educational Statistics (NCES). (1994). *Education and labor market outcomes of high school diploma and GED graduates*. Washington, DC: U.S. Department of Education.

National Center on Educational Statistics (NCES). (1993). *Language characteristics and schooling in the United States, a changing picture: 1979-1989*. Report 93-699. Washington, DC: U.S. Government Printing Office.

National Council of Teachers of Mathematics (NCTM). (1989). *Curriculum and evaluation standards for school mathematics*. Reston, VA: Author.

National Educational Goals Panel. (1994). *National Educational Goals Report: Building a nation of learners*. Washington, DC: U.S. Government Printing Office.

National Governors Association. (1993). *The debate on opportunity-to-learn standards*. Washington: DC: Author.

Newman, A., Lewis, W., & Beverstock, C. (1993). *Prison literacy: Implications for program and assessment policy* (Technical Report No. TR93-01). Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Northcutt, N. (1975). *Adult functional competence: A report to the Office of Education Dissemination Review Panel*. Austin, TX: University of Texas.

Paris, S. G., Gadsden, V. L., & Parecki, A. D. (1995). *Family literacy: Characteristics of exemplary programs in Michigan, 1994*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Reder, S. (1994). *Learning to earn: The role of incentives in work-based learning*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Reder, S. (1994, February). NALS raises vital equity issues. *NCAL Connections*, 1, 7-8.

Reder, S. (1995). *Literacy, equity and societal outcomes*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Reder, S. (1995). *What does NALS measure? Issues of dimensionality and construct validity*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Reder, S., & Wikelund, K. R. (1994). *Steps to success: Literacy development in a welfare-to-work program*. Washington, DC: National Institute for Literacy.

Rethemeyer, R. K. (1995). *Joining the on-line community: An introduction for adult literacy*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). (1991). *What work requires of schools: A SCANS report for America 2000*. Washington, DC: U.S. Government Printing Office.

Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). (1992). *Learning a living: A blueprint for high performance*. Washington, DC: U.S. Government Printing Office.

Shafrir, U. (1995). *Adult literacy and study skills: Issues in assessment and remediation*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Stern, D., & Wagner, D. A. (Eds.). (in press). *The school-to-work transition: A cross-national analysis*. Cresskill, NJ: Hampton Press; and United States Congress, Office of Technology Assessment. (1990). *Worker training: Competing in the new*

international economy. (OTA-ITE-457). Washington, DC: U.S. Government Printing Office.

Sticht, T. (1995). *The military experience and workplace literacy: A review and synthesis for policy and practice*. NCAL Report TR94-01. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Stites, R., Foley, E., & Wagner, D. A. (1995). *Standards for adult literacy: Problems and prospects*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Thornburg, D. G. (1993). Intergenerational literacy learning with bilingual families: a context for the analysis of social mediation of thought. *Journal of Reading Behavior, 25*, 323-349.

Tucker, M. (1990). *America's choice: High skills or low wages!* Syracuse, NY: Center for Education and the Economy.

Turner, T. C. (1993). *Literacy and machines: An overview of the use of technology in adult literacy programs*. NCAL Report TR93-3. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

U.S. Congress, Office of Technology Assessment. (1993). *Adult literacy and new technologies: Tools for a lifetime* (OTA-SET-550). Washington, DC: U.S. Government Printing Office.

U.S. Congress, Office of Technology Assessment. (1990). *Worker training: Competing in the new international economy*. (OTA-ITE-457). Washington, DC: U.S. Government Printing Office.

U.S. Department of Education. (1994). *National evaluation of the Even Start Family Literacy Program: Report on effectiveness, analysis of highlights*. Washington, DC: U.S. Government Printing Office.

U.S. Government Accounting Office (1993). *School age demographics*. Report GAO/HRD-93-105BR. Washington, DC: GAO.

Venezky, R. L. (1992). *Matching literacy testing with social policy: What are the alternatives*? NCAL Report PB92-01. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Venezky, R. L. (1995). *Literacy assessment in the service of literacy policy*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Venezky, R. L. (1995). *Patterns of adult reading development: A longitudinal study*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Venezky, R. L., Bristow, P., & Sabatini, J. (1993). *When less is more: A comparative analysis for placing students in adult literacy classes*. NCAL Report TR93-08. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Venezky, R. L., & Sabatini, J. (1995). *Knowledge, strategies, and fluency: A tripartite model for adult literacy learning and assessment*. Draft NCAL Report. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Venezky, R. L., & Wagner, D. A. (1994). *Supply and demand for literacy instruction in the United States*. NCAL Report TR94-10. Philadelphia: University of Pennsylvania, National Center on Adult Literacy.

Wagner, D. A. (1992). *Literacy: Developing the future*. Unesco Yearbook of Education, 1992, Vol. 43. Paris: Unesco.

Wagner, D. A. (1993). *Literacy, culture and development: Becoming literate in Morocco*. New York: Cambridge University Press.